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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/780,380	02/12/2001	Gang-Ho Kim	0630-1238P	7042

2292 7590 06/17/2004

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EXAMINER
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GHULAMALI, QUTBUDDIN

ART UNIT	PAPER NUMBER
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2631

DATE MAILED: 06/17/2004

3

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/780,380	KIM, GANG-HO
Examiner	Art Unit	
Qutub Ghulamali	2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 12 February 2001.

2a)  This action is FINAL.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1-4 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1-4 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on \_\_\_\_\_ is/are: a)  accepted or b)  objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
    Paper No(s)/Mail Date \_\_\_\_\_.  
4)  Interview Summary (PTO-413)  
    Paper No(s)/Mail Date. \_\_\_\_\_.  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: \_\_\_\_\_.  
\_\_\_\_\_

## DETAILED ACTION

### *Specification*

1. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure in the present instant exceeds the range of 50 to 150 words.

Appropriate correction is required.

2. The disclosure is objected to because of the following informalities: In the specification on page 1, line 9, the examiner suggests that be prior to "DD error...", --Decision-Directed--, should be inserted, and "DD" should be enclosed in parenthesis.

In the specification on page 6, line 16, the word "hardwarically" requires correction or it be removed.

Appropriate correction is required.

3. Claim 1 is objected to because of the following informalities: Claim 1, line 4, prior to "DD", --Decision-Directed--, should be inserted, and "DD" should be enclosed in parenthesis.

Similarly, claim 2, line 3, prior to "DD", --Decision-Directed--, should be inserted, and "DD" should be enclosed in parenthesis.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "summing them, and then obtaining the absolute value of the error" in lines 9-10, of claim 1. There is insufficient antecedent basis for this limitation in the claim.

Regarding claim 4, the phrase "similar" and "multiplied 3-4 times larger" in lines 2 and 4, renders the claim(s) indefinite because the claim(s) include(s) elements not actually disclosed (those encompassed by "similar" and "multiplied 3-4 times larger"), thereby rendering the scope of the claim(s) unascertainable. See MPEP § 2173.05(d).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over applicant's admitted prior art in view of Davis et al ("Davis") (US Patent No. 6,505,222).

Consider claim 1, the applicant's prior art discloses (figs. 1 and 4) a combined G-pseudo channel equalizer including an equalizer filter 10 for correcting an error of received data, a Decision-Directed (DD) slicer for generating an error upon receipt of a correction signal outputted from the equalizer filter 10, a DD error size calculation unit 40 for calculating the size of the outputted DD error, a Sato slicer unit 50, a Sato slice 51 calculate the inputted signal to output the normal value of the inputted value and an abstractor 52 abstract the value outputted from the equalizer 10 from the calculated normal value to thus generate a Sato error, see disclosure page 4, lines 9-13. Applicant's admitted prior art however, fails to disclose a DD error size calculation unit for taking the absolute value of the errors, summing them and then obtaining the absolute value of the error. Davis discloses a channel equalizer (figs. 3, 4, 5, 8), comprising an equalizer filter for the feedforward section 106 and the feedback section 108 for error correction, decision-directed (DD) slicer detector 88 in which the slicer/detector 88 uses indexed reference signal levels that may vary from the ideal levels, a bias control system 90 (error size calculation) including an absolute value unit 127 that generates the absolute value or magnitude of the error signal generated by the adder (summer) 126, the absolute value unit 127 may be designed to generate the absolute value or magnitude of the error signal or may alternatively be designed to square the error signal (col. 10, lines 5-11, 33-40). It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Applicant's admitted prior art to include an error size calculation unit for taking the absolute

value of the errors, summing them and then obtaining the absolute value of the error so as to improve equalizer performance as taught by Davis.

Regarding claim 2, Applicant's admitted prior art discloses the DD slicer unit 20 calculate the inputted signal to output the most approximate value of the original signal, an abstractor 22 abstract the outputted value from the equalizer filter 10 to generate a DD error, the DD error is multiplied by a scale constant k1 to be converted into the Sato error mode. Applicant's admitted prior art however, fails to disclose the absolute value of the errors, summing them and then obtaining the absolute value of the error, obtaining the absolute value of an inverse response signal of a channel by multiplying the absolute value of the first error by second error multiplied by a scale constant. Davis discloses a channel equalizer (figs. 3, 4, 5, 8), decision-directed (DD) slicer detector 88 in which the slicer/detector 88 uses indexed reference signal levels that may vary from the ideal levels, a bias control system 90 (error size calculation) including an absolute value unit 127 that generates the absolute value or magnitude of the error signal generated by the adder (summer) 126, the absolute value unit 127 may be designed to generate the absolute value or magnitude of the error signal, the adaptive digital filter 94 may be implemented as a finite impulse response (FIR) filter comprising a tapped delay line with associated tap coefficients the output from the adaptive digital filter 94 is combined with the digitized signal from the AGC 78 in an adder 96 (col. 8, lines 27-34; col. 9, lines 43-56; col. 10, lines 33-55; col. 13, lines 1-5).

Regarding claim 3, Applicant's admitted prior art in combination with Davis disclosed all the subject matter described above except the equation for obtaining the inverse response and the equation for taking the absolute value of the errors. However, transform equations are well

known in the art. Thus, it would have been obvious to the person of ordinary skill in the art at the time of invention was made to use equations to express the channel response in mathematical form.

Regarding claim 4, adjusting the size of the errors can be regarded as design issues that can be adjusted to size as deemed necessary.

***Conclusion***

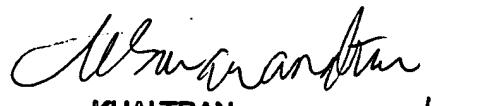
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Patel et al (US Patent No. RE38,456 E), Nobakht et al (US Patent 5,692,011) are cited as arts of interest showing channel equalization apparatus.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Qutub Ghulamali whose telephone number is (703) 305-7868. The examiner can normally be reached on Monday-Friday from 8:00AM - 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 703 306-3034. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

June 11, 2004.

  
Khai Tran  
PRIMARY EXAMINER 